

of bone divided into a million of little cubes, (each measuring the one-hundredth of an inch on either side) every one of them would be more than a thousand times larger than the particles as they exist in bone. Now, because the degree of solubility of substances difficult of solution is greatly enhanced by being made fine, you can readily see why I stated that bone thus treated was nearly as useful as if made into superphosphate.

The next commercial fertilizer which I mention, is

PERUVIAN GUANO.

This, as formerly imported, contained from 15 to 17 per cent. of ammonia, but latterly from 11 to 13 per cent. The high price it bears is chiefly due to this content; for of all the manurial agents which the farmer has occasion to buy, the dearest is nitrogen in such form or combination that plants can appropriate it to their use. Peruvian guano contains a small percentage of potash; also about one half as much phosphate as raw bone; but as before remarked, its chief commercial value is due to its nitrogen. Like other ammoniacal manures, its principal use is for grain and grass crops; and the chief profit from its use is realized upon lands rich in mineral constituents.

Peruvian guano cannot be continuously used and crops sold off, without rapid impoverishment of the land, except upon soils rich in dormant mineral resources. A considerable portion of the land in the Southern States is of this character, and hence the high repute in which Peruvian guano continues to be held there.

But to use it with impunity in New England, it is *imperatively necessary* that the bulk of all which is grown by it should be consumed upon the farm and returned to the soil in manure.

For general use among us, it is found that the proportions of ammonia and the phosphates in Peruvian guano, are not those which may be employed to advantage. There is too much of the former in proportion to the amount of the latter.

It is found that a manure containing more phosphate and less ammonia is safer, and better to use, and cheaper to buy; and this experience, coupled with the fact that we have in fish guano, or "porgy chum," so largely produced along our coast line, abundant supplies of a manure nearly identical in character and results, with Peruvian guano, —has caused an almost total abandonment of its use in this section. It is true that our fish guano is of less uniform quality and less concentrated, but its cheapness makes amends for the difference.

It is much to be regretted that so large a proportion of the fish refuse is not better cured, so as to retain the manurial efficacy which it has while fresh. Within the last ten years, however, there has been a vast improvement in this respect, and yet there is need of a great deal more. *When well dried immediately upon coming from the press, fish guano may be deemed to be one-half as valuable as Peruvian guano; otherwise one-third to one-tenth.*

(Concluded next week.)

The *Burlington Daily Free Press* is entitled, we think, to more notice and recognition at the hands of its brethren of the Vermont press than it gets, both for its value as a dispenser of news and for the dignity, ability and fairness of its editorial management. In general and telegraphic news, it is little behind the dailies of the large cities, while in regard to all important occurrences within the state it is fresh and full. That it does not defile its columns with the flood of dirty little personal items upon which some editors pride themselves so highly, is altogether to its credit. In both national and state politics, while it aims to be true to its party, it is always on the side of honesty, economy, and the maintenance of the highest standard of national integrity. For these characteristics we wish it well, and would be glad to see its already large circulation rapidly added to in all parts of the state. It is a "home institution" that deserves well of the people.

Butter sold at from 20 to 32 cents in the Middlebury market on Monday.

Vermont Farmer

T. H. HOSKINS, M. D., Editor.

Communications and letters relating to the editorial management of the paper should be addressed to the Editor. All others should be addressed to the Publisher, or simply to the FARMER. Both, however, may be reached in the same letter.

The FARMER is sent to regular subscribers at \$1.00 different Post Offices in Vermont, and to quite a large number out of it.

CANVASSING AGENTS:

S. O. WHIPPLE,.....JAMES G. SMITH.
WM. H. SANBORN,.....EBEN THOMPSON.

COMMERCIAL MANURES.

We give upon our first page a portion (to be completed next week) of a paper by Mr. Goodale, bearing the above title. Mr. G. (who has been for upwards of fifteen years the honored and efficient secretary of the Board of Agriculture of his state,) is eminently qualified, both scientifically and practically, to treat of this important subject in a way calculated to be useful and instructive to farmers. A practical cultivator of the soil himself for many years, he adds to experience thus acquired strong native talents, an ardent love of agriculture, and high scientific acquirements. To receive the instructions, either written or oral, of such a man is a privilege not to be despised, and when we add the undisputed fact that no man in New England stands higher in point of personal character than Mr. Goodale, we think our readers will have no difficulty in seeing how valuable must be his teaching upon a subject to which he has given, and is constantly giving, so much attention.

In the opening remarks of his paper, Mr. Goodale alludes, in the frank spirit so characteristic of all that he writes and says, to his connection, as chemist, with the Portland Phosphate Works. It would be well, perhaps, for us to speak a little more fully than he does upon that point.

This manufactory (the corporate title of which is "The Cumberland Bone Company,") had a very different origin from most works of the kind. It was not originally designed as a commercial enterprise. Around the city of Portland are many skilled and enterprising farmers and gardeners, and one of their chief crops is sweet corn, grown on an extensive scale for the purpose of supplying a number of canning establishments, the joint annual sales of which amount to many hundreds of tons. This is almost a specialty of the locality, and their canned sweet corn is known all over the world. The process by which the work is done is original and peculiar, preserving the genuine flavor of the corn in such a superior way as to give almost a monopoly of the market. The farmers who grow this corn in fields of from ten to fifty acres, soon found the necessity for additional fertilizers, more than they could produce upon their farms, it being essential in this business to produce the very best corn; full, long and perfect ears alone being desired at the factories. Hence corn-growing is a science with them, and as a science it soon became evident to them that some powerful ammonio-phosphatic manure, such as corn requires, should be applied to their land every year.

They found that which in the market purported to be such to be very unreliable, and applying to Mr. Goodale, received the advice to which he alludes, namely, that they should make their own superphosphate. This they finally determined to be a necessity for them, and they called upon Mr. Goodale for his assistance. The resulting product was so vastly superior to the common article, and its effects were so conspicuous in their crops, that a demand immediately sprang up outside

of the membership of the company, which could not be supplied without greatly enlarging their works. The "Cumberland Superphosphate" rapidly acquired a wide reputation, and now the demand has been extended over the whole Atlantic sea-board, and far into the interior. We believe there is not an instance on record when it has once been introduced, that any other manufacture has been able to displace it, while it is continually driving other brands from localities where they seemed to have an assured footing. These statements, we think, are unquestionable.

These works, it is stated, unlike most others, have from the beginning made but one kind of fertilizer, and that has been the very best that could be made, having due regard to practical economy of manufacture and use. No diluting material, or substance designed to increase bulk or weight at the expense of quality, is ever added to it. Its phosphatic constituent is simply pure ground bone, acted upon by sulphuric acid to make it soluble. To this is added, for the purpose of affording a larger proportion of ammonia, dried and ground fish-cake of the best quality. This fish-cake is largely produced at the fish-oil factories that are so numerous along the coast of Maine. It differs much in quantity, the best and driest yielding about half as much ammonia as the best Peruvian Guano, such as used to be imported before the deposits were so nearly exhausted, and nearly as much as the average of that now imported. Mr. Goodale's skill as a chemist, and his opportunities for inspecting the fish-cake at the factories, enables him to secure the pick of the product, and none but the very best is taken.

It is thus plain that the farmers of Maine are blessed with that great desideratum, a perfectly reliable, uniform and powerful fertilizer. The difficulty of reaching Vermont by rail from Portland has heretofore prevented the appearance of this fertilizer in our markets, but with the opening of new routes now in process of construction the difficulty will be obviated. We learn that, with this prospect in view, sample lots will soon be offered in some of our principal towns for trial, and we would urge those of our readers who may have the opportunity to give it a trial. Prof. Collier, the Secretary of our Board of Agriculture, has promised us to furnish our readers during the winter with analyses of all the leading fertilizers that seek our markets, and that of the Cumberland superphosphate will be among them.

The "Catalogue of the University of Vermont and State Agricultural College for 1871-2" is before us, very neatly printed by the *Free Press* Company. It makes one rather sad to look over the list of students and see how brief it is compared with what it should be, and would be, if the people of Vermont gave their University the aid, comfort and support to which it is justly entitled. See Dartmouth growing rich and powerful, not only by the help of its own community, but on Vermont money! And yet, with Dartmouth so strong and the University comparatively so weak, we cannot blame the ambitious youth of the Vermontside of the Connecticut Valley, for making her their *Alma Mater*. The fault is "not in our stars but in ourselves" that there has not long before this been built up in Burlington an institution that should command the patronage of every native student, and bring hundreds from abroad to share its advantages. But we are glad, notwithstanding all this, to know and be able to testify that the University is not standing still, much less retrograding; and we only hope that the efforts of her able Fac-

ulty and Corporation may be seconded as they should be by our Legislature and by wealthy and patriotic citizens of the State. As a literary and scientific institution the University might now easily be put on a footing to compete on equal terms with any of its rivals;—as an Agricultural College we hope soon to see the time when *Stat Nominis Umbra* will cease to be its best description. Two recent changes are to be noted, indicative of a determination to keep even with the times—the admission of female students to the scientific and literary departments on an equality with males, and the change of Commencement day which will hereafter be on the second Wednesday in July.

At Oxford, in Chester County, Pa., is published a bright agricultural monthly, of the size, form and price of the VERMONT FARMER, called *The Farmers' Club*. It makes a specialty of reporting the proceedings of the numerous Farmers' Clubs in that thriving county, and does it well. Several things we observe about these Pennsylvanian clubs that seem worthy of notice, if not of imitation. They meet monthly throughout the year, at the member's houses, in rotation, and, taking the whole day for it, have papers read in the morning, partake of a good dinner, take a walk over the farm and through the buildings, and on reassembling spend the afternoon in commenting upon what they have seen and discussing what they have heard. This programme seems to be kept up with great spirit and effect by all the Clubs, and we notice that the roll of members is called at the opening and close of the meetings, and fines exacted from absentees. This would break up most Clubs in Vermont, we fear, but the Pennsylvanians seem to thrive under the system. The fact is, they are in earnest. We wonder if these strongly managed Farmers' Clubs don't account for the fact that Chester County farmers get seventy-five cents a pound for butter, and are willing to pay as much for a monthly paper as our patrons pay for a weekly one of the same size?

NOTES AND QUERIES.

"Plant Food."

"I like much the modest courage you have shown in sustaining your views on this point against Dr. Nichols. I observe that the Doctor allows that the carbonic acid and nitric acid of the soil-water have solvent powers over mineral substances, but denies that power to oxalic acid. I wish you would ask him in your next article if carbonic acid or nitric acid *out of the soil* has any more solvent action on feldspar than oxalic acid.

CHEMICAL STUDENT.

Salem, Mass., Dec. 12."

As it is doubtful if we resume the subject at present, we print our correspondent's note and solicit Dr. N's attention thereto.

Beet Sugar.

Professor Goessmann of the Mass. Agricultural College, who is laboring with zeal and success to demonstrate the possibility of a profitable manufacture of Beet Sugar in New England, writes to us as follows on the subject:—

"I send to-day by Express a little box to your address containing two samples of my Beet Sugar, and two samples of Superior Sugar Beet Seeds, both of which I hope will prove acceptable to you."

We believe it will soon be satisfactorily shown that Beet Sugar can be profitably made in New England, and especially in Vermont, where the people are already familiar with a sugar manufacture, not so complicated indeed as that from beets, but yet one that will at least give them an intelligent